

Inventions & Innovation Project Abstract

Freight Wing Second Generation Trailer Aerodynamics

Freight Wing, Incorporated used its 2003 Inventions and Innovations (I&I) grant to successfully research, develop, test, patent, market, and sell innovative fuel and emissions saving aerodynamic devices for the trucking industry. Freight Wing plans to continue developing and testing its products in partnership with some of America's largest and most respected trucking fleets, while simultaneously implementing a commercialization strategy capable of achieving widespread market acceptance.

A great deal of past scientific research has demonstrated that streamlining box shaped semi-trailers can significantly reduce a truck's fuel consumption. However, significant design challenges have prevented past concepts from meeting industry needs. Products must not interfere with the operation of the truck, require significant maintenance, or add significant weight, but they must save enough fuel to generate a timely return on investment. Moreover, they must be extremely durable, and SAE/TMC J1321 standardized tests performed by a respected independent laboratory are absolutely necessary for large fleets to even consider purchase. Freight Wing used these criteria to create a system of three practical aerodynamic attachments for the front, rear, and bottom of standard semi-trailers. SAE/TMC J1321 Type II tests performed by the Transportation Research Center (TRC) demonstrated a 7% improvement to fuel economy with all three products- the best J1321 results published for an aerodynamic trailer. The testing also enabled Freight Wing to identify areas for potential improvement. Freight Wing plans to develop second generation designs capable of increasing the energy savings to an estimated 10%, while reducing product costs and enhancing durability. Freight Wing also plans to secure cost sharing partnerships with existing contacts at major fleets in order to outfit trailers for testing and evaluation purposes.

Freight Wing products provide an opportunity to significantly reduce U.S. foreign oil consumption and harmful truck emissions. The first generation products have been proven to save 7% of a truck's fuel, which represents a drag reduction of approximately 14%. The second generation designs could meet the 20% DOE goal years ahead of schedule. If all applicable trailers used the existing technology, our country could save approximately 1.8 billion gallons of diesel fuel, 20 million tons of emissions and 3.6 billion dollars annually.



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